1. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{10x^3 - 59x^2 + 61x + 60}{-10x^3 + 3x^2 - 27x - 36}$$

A. Horizontal Asymptote of $y = 0$

B. Vertical Asymptote of $y = 1.500$

C. None of the above

D. Horizontal Asymptote of $y = -1.000$

E. Vertical Asymptote of $y = 4$

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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 - 50x^2 + 93x - 45}{8x^2 - 10x - 25}$$

A. Vertical Asymptote of $x = 1.0$ and hole at $x = 2.5$

B. Vertical Asymptote of $x = -1.25$ and hole at $x = 2.5$

C. Holes at $x = -1.25$ and $x = 2.5$ with no vertical asymptotes.

D. Vertical Asymptotes of $x = -1.25$ and $x = 2.5$ with no holes.

E. Vertical Asymptotes of $x = -1.25$ and $x = 0.75$ with a hole at $x = 2.5$

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3. Which of the following functions *could* be the graph below?
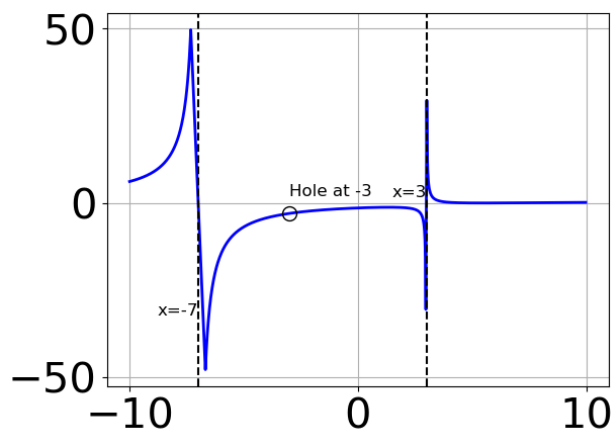
A. $f(x) = \dfrac{x^3 + 8.0x^2 - 3.0x - 90.0}{x^3 - 7.0x^2 - 9.0x + 63.0}$

B. $f(x) = \dfrac{x^3 - 8.0x^2 - 3.0x + 90.0}{x^3 + 7.0x^2 - 9.0x - 63.0}$

C. $f(x) = \dfrac{x^3 + 13.0x^2 + 52.0x + 60.0}{x^3 - 7.0x^2 - 9.0x + 63.0}$

D. $f(x) = \dfrac{x^3 - 10.0x^2 + 19.0x + 30.0}{x^3 + 7.0x^2 - 9.0x - 63.0}$

E. None of the above are possible equations for the graph.

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4. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 - 65x^2 + 74x - 24}{3x^2 - 11x + 6}$$

A. Oblique Asymptote of $y = 4x - 7$.

B. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x - 7$

C. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 4x - 7$

D. Horizontal Asymptote of $y = 4.0$

E. Horizontal Asymptote at $y = 3.0$

5. Which of the following functions *could* be the graph below?
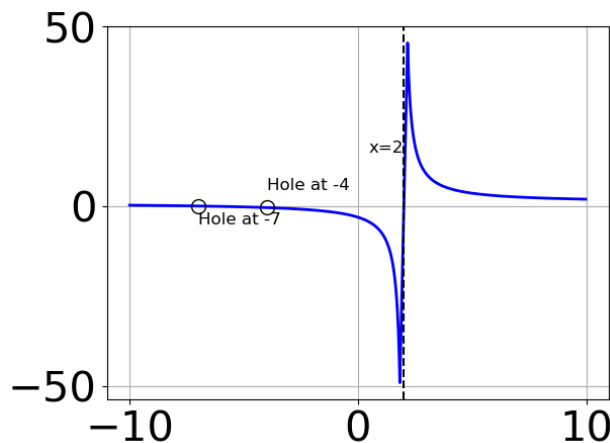


A. $f(x) = \dfrac{x^3 + 14.0x^2 + 63.0x + 90.0}{x^3 + 9.0x^2 + 6.0x - 56.0}$

B. $f(x) = \dfrac{x^3 + 17.0x^2 + 94.0x + 168.0}{x^3 + 9.0x^2 + 6.0x - 56.0}$

C. $f(x) = \dfrac{x^3 - 17.0x^2 + 94.0x - 168.0}{x^3 - 9.0x^2 + 6.0x + 56.0}$

D. $f(x) = \dfrac{x^3 - 7.0x^2 - 24.0x + 180.0}{x^3 - 9.0x^2 + 6.0x + 56.0}$

E. None of the above are possible equations for the graph.

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6. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 - 18x^2 - 11x + 30}{16x^2 + 32x + 15}$$

A. Vertical Asymptotes of $x = -0.75$ and $x = 1.5$ with a hole at $x = -1.25$

B. Vertical Asymptote of $x = -0.75$ and hole at $x = -1.25$

C. Vertical Asymptote of $x = 0.5$ and hole at $x = -1.25$

D. Vertical Asymptotes of $x = -0.75$ and $x = -1.25$ with no holes.

E. Holes at $x = -0.75$ and $x = -1.25$ with no vertical asymptotes.

7. Determine the horizontal and/or oblique asymptotes in the rational function below.
$$f(x) = \frac{9x^3 - 18x^2 - 64x - 32}{3x^2 + 19x + 20}$$

A. Horizontal Asymptote of $y = -5.0$ and Oblique Asymptote of $y = 3x - 25$

B. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 25$

C. Horizontal Asymptote at $y = -5.0$

D. Horizontal Asymptote of $y = 3.0$

E. Oblique Asymptote of $y = 3x - 25$.

8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{15x^3 + 26x^2 - 51x + 18}{-15x^3 + 8x^2 + 3x + 18}$$

A. Vertical Asymptote of $y = -0.667$

B. None of the above

C. Horizontal Asymptote of $y = 0$

D. Vertical Asymptote of $y = -3$

E. Horizontal Asymptote of $y = -1.000$

9. Determine the vertical asymptotes and holes in the rational function below.
$$f(x) = \frac{9x^3 - 24x^2 + 4x + 16}{12x^2 + 23x + 10}$$

A. Holes at $x = -1.25$ and $x = -0.667$ with no vertical asymptotes.

B. Vertical Asymptotes of $x = -1.25$ and $x = -0.667$ with no holes.

C. Vertical Asymptotes of $x = -1.25$ and $x = 1.333$ with a hole at $x = -0.667$

D. Vertical Asymptote of $x = 0.75$ and hole at $x = -0.667$

E. Vertical Asymptote of $x = -1.25$ and hole at $x = -0.667$

10. Determine the vertical asymptotes and holes in the rational function below.
$$f(x) = \frac{9x^3 - 18x^2 - 7x + 20}{6x^2 + 7x - 20}$$

A. Vertical Asymptotes of $x = -2.5$ and $x = 1.667$ with a hole at $x = 1.333$

B. Vertical Asymptote of $x = 1.5$ and hole at $x = 1.333$

C. Vertical Asymptotes of $x = -2.5$ and $x = 1.333$ with no holes.

D. Vertical Asymptote of $x = -2.5$ and hole at $x = 1.333$

E. Holes at $x = -2.5$ and $x = 1.333$ with no vertical asymptotes.